Killer Hardware Tips

Too Cool To Follow Rules

If you're a user who can't leave things alone if there's a chance you can make them better, even it if means bucking the norm, read on. We have some tips and tricks that just might help your system look cooler and make you more productive.

The Lap Of Luxury Is Flat, Smooth & Cool

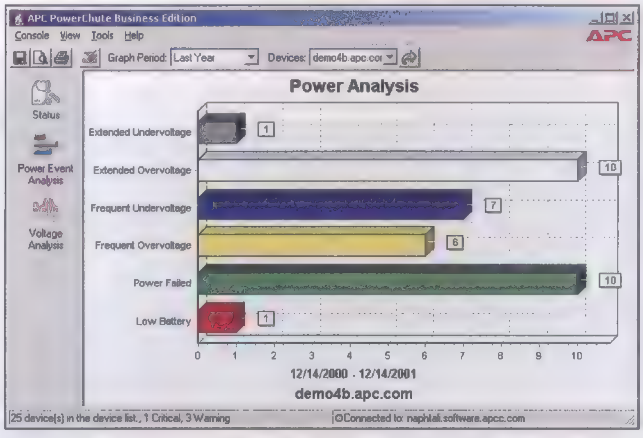
The better the contact is between your heat sink and CPU, the better job it can do dissipating heat. If the sink's contact surface is irregular or curved, it won't absorb the maximum amount of heat from the processor. Flattening, or lapping, the heat sink can maximize that crucial contact area, keeping the processor cooler.

"Optimal heat transfer occurs when both mating surfaces—the heat sink and the chip—are perfectly flat," says Scott Madison, an MCI Worldcom engineer and author of an article on lapping (www.sysopt.com/articles/lap). "Generally, the heat sink is the part that benefits the most from lapping. This is largely due to the way heat sinks are manufactured. The manufacturing process often introduces variations in the mating surface leading to forms that are convex, concave, or with scratches and grooves. All of these hinder the mating surface and heat transfer."

You can lap your heat sink by hand using sandpaper, which can take hours, or do it more quickly if you have access to a machine shop. "You can tell the process has been completed correctly when the surface of the heat sink is perfectly flat (or nearly so) from edge to edge and has a glass or mirror-like finish," Madison says.

Although thermal paste can aid heat transfer by filling in microscopic variations between the mating surfaces, paste often won't fill in the gaps caused by a convex or concave heatsink surface. In fact, too much paste may decrease the amount of heat transfer.

You can also lap the chip you're trying to cool, but this is risky and can destroy the chip. You should only attempt to lap a CPU that doesn't directly expose the chip core. Older processors—Intel up to and including Pentium II and AMD up to and including the K6-3—and chips on video cards and motherboards are constructed in a manner that doesn't expose the core. "This is also true of the newest Pentium 4, which has a heat transfer cap," Madison says. "Since the chip core is not directly exposed, lapping can be done with much less risk than on chips based on the Pentium III/Celeron and the AMD Athlon/Duron designs."



American Power Conversion's free PowerChute Business Edition software shows you graphs that depict the power hiccup trends of your PC. Such programs may also include e-mail notification if power goes out.

Is Your Computer Leaking?

Your computer is broadcasting information about you, and government goons in a van nearby are eavesdropping. Sounds like a plot from a bad cracker movie. Far-fetched but not impossible.

As you use your PC, it emits radio signals others can capture and decode to reveal information, ranging from simple activity levels to remotely copying keystrokes or capturing monitor information. This is according to "TEMPEST in a teapot" (www.eff.org/Privacy/Security/tempest_monitoring.article), a paper about reducing the susceptibility of PCs to remote monitoring.

Written in 1993, the information remains relevant. "Basic physics haven't changed too much in the last decade. I believe the main idea is still valid that radio frequency interference prevention as a side effect limits any signal intelligence that could be derived from the broadcast," says Grady Ward, author of the paper.

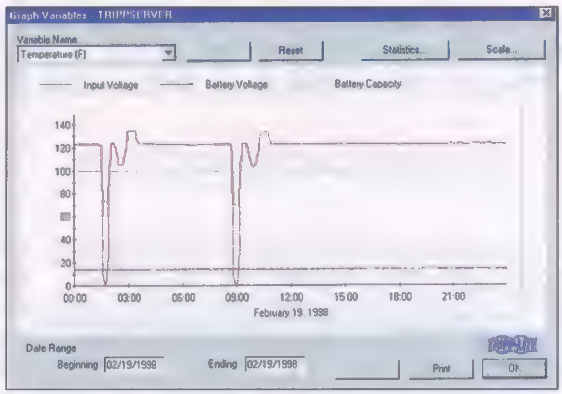
"With everything from 802.11b to IrDA-enabled cell phones, eavesdropping is much easier now," says Ward. "I believe that this has been an intelligence windfall to certain organizations who have no scruples about covertly collecting information, then selling, trading, or blackmailing with it."

Ward offers these tips and information to keep work from prying eyes and ears:

- Use Class B computers and peripherals, which have the least amount of

spurious emissions. (Class A is a less stringent standard allowed in business equipment.)

- Don't operate a PC with its cover off. Keep slot covers in place.
- Use shielded cables for all system connections, and make the cables as short as possible.
- Use an EMI (electromagnetic interference) filter to block signal radiation from power cords into house wiring.
- Use phone jack EMI filters to shield your telephone, fax, and modem lines, preventing them from retransmitting your computer's radio-frequency interference signals.
- Use ferrites to prevent EMI from escaping on your cables' surface. "Ferrites are magnetic materials that attenuate the EMI by causing it to spend itself in heat rather than continuing down the cable," according to Ward's paper. "Every cable leaving your monitor, computer, mouse, keyboard, and other computer peripherals should have at least one ferrite core attenuator."
- Don't use wireless peripherals.
- Don't rely on the encryption built into your Wi-Fi router. Supplement built-in security with stronger encryption tools.



Combine a microprocessor-controlled UPS with software on your PC to monitor the electricity, battery, and other data only a geek would want know.

Take A Power Trip

If your electricity is prone to outages, you need a UPS or battery backup for your PC to give you time to save your work and shut down when power outages occur. Having a big PC battery is useful, but the geek fun really begins when you connect a UPS to a serial or USB port.

By letting the PC monitor the UPS, you can set it to automatically shut down when the power's out and the battery is waning. Even today's cheapest UPSes include a data port. You simply need a standard serial or USB cable to connect the UPS to the PC.

With a more expensive, microprocessor-controlled UPS, you can monitor the power and internal workings of the UPS via graphs of line voltage, battery load, and operating temperature.

Win2000 and XP have basic UPS monitoring and shut down functions. You can use more advanced software from a UPS manufacturer. American Power Conversion offers Power-Chute software (www.apcc.com). Tripp Lite has PowerAlert (www.tripplite.com/software). These programs can add features such as outage notification via e-mail or pager and server application shutdown. Some high-end UPSes include load shedding, which prioritizes devices, turning off nonessential systems first.

A Clean Computer = A Happy Computer

One way to make your computer run cooler is surprisingly low-tech: clean it.

When Alastair Price, an avionics engineer and amateur case modder, opened a friend's PC to install an upgrade, he discovered dust, dead bugs, and other sundry grime. He removed all components, cleaning them thoroughly. Afterward, the CPU ran 10 degrees Celsius cooler.

The key to this cooling is disassembling and cleaning the CPU-heat sink-fan assembly. Removing the accumulated dust around the heat sink fan allows for better airflow and provides for more efficient cooling. Price published a Web page on the process at www.unique-hardware.co.uk/howto.asp?howto=dustingpc.

"The 10 degrees difference was just a personal observation after I had carried out the cleaning techniques on my own PC. I can't guarantee the same temperature difference will be found by other people. However there seems to be a significant temperature drop after the heat sink fan has been cleaned. It could be as little as 2 or 3 degrees or as much as 10 degrees," Price says.

The more fans your case has, the more grime it collects. As long as your computer is open, clean the motherboard, cards, drives, and other parts. This won't make your computer run cooler, but it will make the components last longer, especially those with moving parts. A vacuum cleaner, small paintbrush, and a little time are the most important tools for cleaning your PC.

A clean PC "cuts down on downtime, repair bills, and minimizes health risks," says Dennis Orloff, the founder of ComputerBath (www.computerbath.com). "The best prevention is to just dust around the computer. Make sure all the dust is removed and guess what: If you remove the dust from outside the computer regularly, you won't have to clean it inside." CPU

by Kevin Savetz

Infinite Loop

DVD For Me, And You, And You . . .

Standalone DVD players are hot—so hot that DVD players outsold VCRs for the first time in September 2001, according to the Consumer Electronics Association. In 2001, 13 million players were sold; this year 16.25 million are expected to be sold. How far has DVD come? In 1996, Time-Warner predicted that 10 million households would have DVD by 2002. In 1997, 400,000 players were sold in the United States and only 900 DVD video titles were available; by 2000, more than 10,000 titles were on shelves.

Additional source: www.theoracle.cx